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SCHEDULE OF MEETINGS

5-8 September	**Regional Committee for Europe, fifth session, Vienna**
5-10 September	**Regional Committee for South-East Asia, eighth session, Bandung**
6-8 September	**PASO Executive Committee, twenty-sixth meeting, Washington, D.C.**
7-14 September	**Expert Committee on Trachoma, second session, Geneva**
9-21 September	**PASO Directing Council, eighth meeting ; WHO Regional Committee for the Americas, seventh session, Washington, D.C.**
13-19 September	**Regional Committee for the Western Pacific, sixth session, Singapore**
19-24 September	**WHO/FAO Joint Conference on Food Additives, Geneva**
19-24 September	**Regional Committee for Africa, fifth session, Tananarive, Madagascar**
21 September	**PASO Executive Committee, twenty-seventh meeting, Washington, D.C.**
27-30 September	**Regional Committee for the Eastern Mediterranean, Subcommittee A, Beirut**
4-11 October	**Expert Committee on Insecticides, sixth session, Geneva**
6-12 October	**Study Group on Epilepsy, London**
10-15 October	**Expert Committee on Biological Standardization, ninth session, Geneva**
13 October-3 November	**FAO/WHO Seminar on Nutrition Education and Health Education, Baguio, Philippines**
17-22 October	**Study Group on Rehabilitation of the Deaf and Partially Deaf Child, Geneva**
24-29 October	**Expert Committee on Professional and Technical Education, third session, Geneva**
24-29 October	**Expert Committee on Drugs Liable to Produce Addiction, sixth session, Geneva**

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MENTAL HEALTH THROUGH PUBLIC HEALTH PRACTICE

The extent of serious mental disease in economically well-developed countries and the problems it creates have been a cause of concern for many years. In most countries of Europe the number of mental hospital beds ranges from one to four per thousand of the population. Until a few decades ago many of the patients occupying these beds remained chronically ill and in need of care for the whole of their life. Of those who did recover, many subsequently relapsed and required further hospitalization.

New methods of physical treatment—insulin therapy, electro-convulsive therapy, and the use of drugs such as chlorpromazine—have led to a more optimistic outlook in the therapeutic field and to the possibility of permanent cure for many patients whose prognosis formerly offered no hope. In many cases the improvement brought about can render patients accessible to psychotherapy, which, when followed by social casework, can produce lasting remissions.

Growing evidence of the influence psychological factors can exercise on these patients has drawn attention to the role of unfavourable psychological states and emotional influences in the etiology of their disorders. An individual, for instance, whose personality development has been weakened in childhood may fall into a state of permanent ill-health when faced with some unaccustomed stress. There is clinical evidence that a large number of neurotic breakdowns take place in response to stresses which would in healthy people create no more than a temporary disturbance. Interest has thus been aroused in the possibility of preventive measures to mitigate stress situations that may impinge upon basically weak personalities. There seems no doubt, also, that many cases of schizophrenia and melancholia can be prevented by mental hygiene methods, particularly through the prompt handling of emotional disorders brought about by immediate environmental stresses. Although it may not be possible to predict the point at which a particular individual will break down, there seems little doubt, statistically, that the number of serious disorders can be reduced through preventive measures.

In European communities many patients have somatic symptoms without signs of ideational disorder. Such patients can often be shown to be suffering from a prolonged emotional state which either causes, or contributes to, what is essentially a neurotic condition. The etiological factors can frequently be traced to unfavourable attitudes developed in early childhood within the family.

The numbers concerned are so vast, however, that a wholesale attack on the problem would require an expenditure of time and money which could not readily be made available. Furthermore, a comprehensive project of this nature might be premature at the moment, since our etiological knowledge, particularly of the earliest phases of development of unfavourable emotional attitudes, is not yet precise enough to indicate exact lines of attack. We can nevertheless hope to mitigate certain forms of ill-health and reduce their incidence through the protection of persons at periods of stress; and we can, through existing medical services, make earlier treatment available.

In 1950 the WHO Expert Committee on Mental Health discussed how concepts and hypotheses derived from clinical experience in psychiatry could be applied through

existing public health practices.[1] In this connexion, there are three essential requirements for the practice of public mental health work:

(1) knowledge of the various emotional stresses and of the needs to which they give rise at various critical periods in a person's life;

(2) development of the general theoretical principles of mental hygiene to be utilized at these points;

(3) establishment of methods by which public health practices may be organized to apply these principles.

The Committee considered fully the needs arising during pregnancy and childbirth; those of the infant, the pre-school child, and the schoolchild; the special needs of the handicapped child; the individual's emotional problems on contracting a communicable disease; and the needs of old people and the chronically sick. The Committee also indicated certain ways in which mental hygiene theory derived from clinical psychiatry might be applicable and broached the difficult practical problem of mental hygiene training for public health workers.

In 1953 the WHO Regional Office for Europe sponsored a seminar at Amsterdam, with representatives from 15 European countries, to explore more closely the problems of different countries in this field and to examine the practical difficulties inherent in the implementation of mental hygiene principles through the public health services. In this connexion the seminar took up the problem of training and reorientation of public health personnel—doctors, nurses, social workers, and others—and attempted to delineate their relationship with specialist psychiatric organizations.

Although the Expert Committee on Mental Health and the Amsterdam seminar described the more important common stresses and mental health requirements, indicating areas of psychiatric theory and practice upon which public health services might draw, no detailed statement was made as to how mental health principles should be applied in public health practice. Indeed, no clear picture had as yet emerged of the areas in which a public health worker could be effective, nor of the methods and extent of training he would require. The Regional Office for Europe, as a next step, therefore called a special study group, which met in Monaco in April 1955, to examine these practical problems. The number of participants was limited to 20, of whom 14 were practising public health officers; 4, nurses or social workers; and 2, psychiatrists already engaged in the teaching of mental hygiene principles to public health personnel.

It was realized at the outset that a group of this nature could make no specific recommendations, since any changes proposed would have to be intimately related to the public health services of each country. It was nevertheless possible that certain general principles which could be applied in different countries might emerge from this further study.

The group met for 12 days and was assisted by one expert in social medicine and another in preventive psychiatry. The role of these two experts was to introduce the problems involved and to act as consultants to the study group.

Most of the discussions took place in two working parties, in each of which the different disciplines were represented. A discussion leader was provided for both groups to facilitate their work, and at the close of the seminar each reported back on its deliberations to a plenary meeting.

A study of the patient

The problems of organizing public health work cannot be considered in the abstract.

[1] *World Hlth Org. techn. Rep. Ser.*, 1951, 31

Six case histories from an investigation conducted in the Netherlands by Professor A. Querido and his assistants, and presented to the study group, were in some degree illustrative of the background to its deliberations. In his introductory talk Professor Querido referred to these cases to throw into relief some of the problems with which participants were faced. For this reason, and because it will lend point to the brief summary of the discussions that follows, parts of Professor Querido's statement are here reproduced.

It was said at the Amsterdam seminar that organization and mechanization are among the chief characteristics of our civilization today. Modern medical practice must necessarily reflect these features and, because medicine is unthinkable without the personal tie between physician and patient, they imply a threat to the basis of medical activity. While we admit that the organization of medical practice is necessary, simply because we want to bring medicine to the largest number of people, we are firmly convinced that the personal tie is essential and must be perfected. It may be that the solution to this dilemma will be found to lie in the integration of mental health principles into medical and, especially, public health practice.

What does it really mean to consider the patient as a person and not as a figure in our administrative organization ?

An investigation into the condition of patients discharged from hospital surgical wards, more or less along the lines of research carried out in Glasgow by Ferguson and MacPhail,[2] revealed to our astonishment that 3-6 months later about half of them still had exactly the same complaints. On investigating these cases more fully we discovered that they were suffering from a variety of disorders which appeared to have been completely disregarded in the hospital. This led to certain questions: What does the hospital doctor know about the patient he has to treat? How much is the patient regarded as a person and not as a narrow somatic problem that can be solved by technical means? And further: if, in the first place, we were to consider the problems of the patient as a whole, might we not change our therapy? Would this not change that terrible result of some fifty per cent. lack of success? A study of the case histories gave some inkling of what happens to the man or woman who gets into the medical machine and of the extent to which that machine may strip the person of his personality. Most of them told a tale of missed opportunities.

The first step in the investigation was taken during the patient's stay in hospital, but might equally have applied to an out-patient department or a practitioner's surgery. The choice of subject was completely at random: a name was picked from the telephone directory and the patient whose name corresponded most closely to it alphabetically was taken. The only further consideration was that he must not be above a certain age, be dying or in great pain.

A doctor interested in psychology, but not a psychiatrist, was then asked to contact the patient in hospital, and a social worker went simultaneously to the patient's home, so that there could be no communication between the patient and his family as to what was said to either investigator. After this first contact the social worker and the doctor compared notes and, if necessary, obtained further data to correct discrepancies or omissions. These, with the medical history, were then handed to me for integration into a composite picture. The cases were then submitted to the clinical staff who had been concerned with the particular patients and the question was put: Do you think that your therapy would remain the same had you had all these facts at your disposal ? In many cases the clinician admitted that he would have acted differently if he had known the full personal history. In fact, in certain instances it was actually possible to change the therapy. As a matter of interest, the time required to compile this type of case history was from five to seven hours. The scantiness of the "hospital data" on which action was originally taken was in itself striking.

The cases, typical of thousands and tens of thousands, showed, I think, that there is something lacking in our medical privisions, not only in the hospital, but in our medical care in general. However, before we start planning large and perhaps revolutionary programmes of education for doctor, nurse, and social worker, before we call for new types of specialist, let us first try to find out exactly what is lacking and what is needed to make medical practice in its widest sense more effective, more fruitful, and more humane. If it is true that the essence of mental health principles implies full interest in, and respect for, the human being as such, the question arises: By whom, by what means and at what points can this interest be integrated into the technical practice of medical care and medical organization? Without its integration a large part of our efforts will be vain and wasted, and a large part of human suffering, which might have been diminished, will remain unrelieved.

[2] Ferguson, T. & MacPhail, A.N. (1954) *Hospital and community*, London

Present status of public mental health work

Members of the study group felt that, among all the widely divergent forms of public health organization in their respective countries, few gave due weight to psychological and social work, either in prevention or treatment. In the majority of cases medical contacts are not based upon a comprehensive knowledge of the human being. There exists, further, a widespread suspicion among medical practitioners, and the public at large, of mental health disciplines and methods.

This limited approach has serious psychological consequences, not only because it leads to a lack of co-ordination among the different medical and social services and to duplication of visits, but also because action in the medical field may be one-sided and taken under inadequate conditions. Unity and continuity of contact should be established in medico-social work.

This unity of action should also embrace the social security services. The development of modern social security systems has in many cases had a far-reaching effect on the attitude of the patient to his illness, and on the attitude of the doctor to the patient. An aspect of this may be seen in the mechanical accordance of facilities which may encourage patients prone to regard their illness as a right to abuse medical attention and prescriptions. In order to utilize social insurance resources to the best purpose it is important not only that the patient be stimulated to an active interest in his recovery, but also that social insurance institutions be better informed of the importance of mental health questions and that their support be made available to meet preventive needs.

Mental hygiene requirements

The need for mental hygiene falls into two main categories, that of preventive work among the general public, and that of treatment in cases of mental sickness. In the latter a further division may be made of cases arising from psychological and social problems that remain within the limits of normal fluctuation and cases which reach abnormal dimensions. In all these fields mental health patients have the right to the same standards of care as are received by the physically ill.

Special groups of persons have their own needs in the field of mental health, among them the aged and the sick; a number of biological occurrences and periods of life require special medical attention. Provisions to meet these requirements have been evolved in most countries: for instance, in ante-natal care, at childbirth, and in child welfare clinics. This is also true in the case of certain common diseases ; and in some countries, national health provisions extend to the care and treatment of the sick.

Since the biologically sensitive or critical periods in life are also sensitive or critical from a mental health standpoint, it is logical that mental health principles should be incorporated into all the above provisions. This means that wherever it is deemed to be necessary to reinforce the health of the public by special measures, not only a somatic problem, but also psychological and socio-psychological problems must be met. Furthermore, all sickness can be regarded as a biological crisis and therefore implies the possibility of psychological or social involvement.

The organization of public mental health work

Those who, in the course of their work, have to deal with these biological phases and crises must therefore also be able to deal with mental health problems. This implies the important principle that public mental health work is not the specialist's job. The specialist is called on to deal with problems that

assume abnormal dimensions, going beyond the normal fluctuation.

Contacts made in the course of normal public-health work may be used for history-taking and diagnosis and consequently for the early treatment and prevention, where necessary, of neurotic and socio-psychological disorders, many of which might tend to be accentuated by a complex of social and somatic factors. A further advantage of starting mental hygiene work at this point is that public health personnel already have a preventive orientation.

The group therefore unanimously stressed the need to promote a mental health outlook among medical and public health workers at all levels.

Team-work

The study group felt that team-work should be a guiding principle in the organization of public mental health practice, and that hierarchical methods should be avoided.

In Finland the problem of mental health has been tackled on this basis. The team in the field consists of a community doctor (corresponding to the general practitioner in most countries), the local nurse, and a midwife. Behind them is a consultant team, composed of a psychiatrist, a paediatrician, and a social worker. The fact that the general medical practitioner is in the forefront strengthens the work of the team, as does the avoidance of interference with the nurse's and the doctor's relationships with the patient. So far as the latter is concerned, he is conscious only of the people he knows—doctor, nurse, or local midwife. These teams have all been working on the basis of anticipatory guidance with a view to preventing the onset of mental disturbance in later years and of correcting bad influences. Teams which are similar in some respects have been initiated in Canada, the United Kingdom, and the United States.

Role of the hospital

There is no doubt that much avoidable hospitalization takes place, and that this measure is often resorted to as an easy solution to problems that could be solved more satisfactorily by preventive mental health work. At the same time, the hospital can play an important role both in preventive and in therapeutic mental health, if a spirit of team-work prevails both among the staff and externally with the appropriate mental health workers, specialists, social workers, and occupational therapists. In many instances this would require a new approach to hospital organization, the establishment of better links between the hospital and the local community, improvement of staff working conditions, and a reappraisal of the value of visiting.

Mental health aspects of public health practice

The vast extent of the need for public mental health work, the experimental nature of much of our knowledge in this field, a certain diffidence on the part of the public and the medical profession towards psychiatry, and the prohibitive cost that would be involved place the creation of any specialized organization to undertake a wholesale attack on the problem out of the question. The study group was therefore of the opinion that it is the public health services themselves that should acquire a fresh orientation, and not that some new organization should be added to them. Whether in hospital, in the out-patient department, or in general public health work, the mental health team should be composed of workers with whom the man in the street is familiar; and the doctor, in particular the general practitioner, should take the lead, while the specialists should stand by ready to give their educational and technical assistance wherever necessary.

In the Netherlands and in the USA there are social psychiatrists who are trained to do preventive work on a group basis with the aim of reaching out to the whole community. There is a case for undertaking the training of such psychiatrists to work in conjunction with medical officers of health and to act as advisers and liaison officers in mental health matters. The teams thus organized, with expert resources on call behind them as part of a larger team, could function experimentally to begin with, within the framework of existing public health organizations.

Education and training

If an appreciation of mental health work is to be acquired at all levels, a start must be made to impart a proper knowledge of mental health principles in the universities and in professional training courses. While the key to the situation must lie in the training of the future physician, all members of the public health services, nurses, midwives, social workers and administrative workers, should receive some basic education in mental health in the course of their training. The medical officer of health has much to learn in the field of mental health; and the psychiatrist, if he is to work in the field of public health, should study epidemiology, sociology, and administration. Teachers, in particular, should be taught mental health principles and be chosen for their ability to apply them.

The crux of the problem in faculties and training schools lies in the provision of suitable curricula and a teaching staff with the right outlook. There was criticism of the fact that the public health services in most countries had little real say in the planning of teaching curricula, whether in medical faculties or in institutes of education.

At the same time, the specialist in abnormal psychology is not the person who is, generally speaking, best qualified to teach preventive mental health principles. The ability to grasp the implications beyond the purely technical problem is not obtained by specific knowledge and psychopathology as such, but by an understanding of normal psychological development, by the ways in which human relationships develop and in which they are expressed and realized in normal society. The work of the psychiatrist may have a most important educational influence, it is true. The methods used to deal with the abnormal can be used to demonstrate how normal tensions and situations can be handled. Nevertheless, the psychiatrist's role should remain that of a consultant.

Given the present limitations in our experience and knowledge of preventive mental health work, much of the necessary educational work in faculties and institutes, as well as among personnel already working in the field, must be led by suitable persons from among those who are seeking to learn through practice. The most suitable method would seem to be through meetings of teams or groups of different professions working in the field in order to examine and discuss specific examples and cases, employing the principles of group dynamics. In this way the ground could be prepared for the development of a qualified teaching personnel among doctors, nurses, social workers, and other professions concerned that would eventually assist in implementing suitably modified curricula in existing institutions. Meanwhile, the medical student might usefully be introduced to the subject through association with field-work. This could in part be related to the treatment of patients in the training hospitals.

Public education in mental health principles demands, in general, a more extensive preparation and distribution of literature on the subject.

The most important need to be met in this field is that of co-ordinated work to promote the education of future parents and young parents through voluntary associations linked with public health services and social

welfare organizations. For this type of education, methods and materials should be put at the disposal of medical and other educators. No discussion of such matters can carry the necessary weight and conviction unless it is founded on a firm scientific basis.

Preliminary material of this type might be compiled on certain well-established and accepted concepts such as the problems of pregnancy, the separation of mother and child, the consequences of hospitalization, and school-age problems.

TECHNICAL ASPECTS OF MALARIA CONTROL

Second Asian Malaria Conference

The action of the Eighth World Health Assembly in recommending a world-wide programme of malaria eradication and establishing a special fund to aid in financing this gigantic effort[1] served to focus attention again on what has become one of the most urgent of international health problems. The Assembly's move was the most recent in a series of steps directed towards a change of strategy in malaria control. Other important steps were the First Asian Malaria Conference (Bangkok, September 1953),[2] at which the status of malaria control in Asia was reviewed and specific recommendations made for the organization of long-term control programmes; the WHO symposium on the control of insect vectors of disease (Rome, October 1953),[3] at which the principal subject of discussion was the development of insect resistance to insecticides; the XIV Pan American Sanitary Conference (Santiago, October 1954),[4] at which it was decided that malaria-control efforts should be intensified and co-ordinated in the Americas in an attempt to eradicate the disease from the Western hemisphere; and the Second Asian Malaria Conference (Baguio, the Philippines, November 1954), at which the technical aspects of malaria control, particularly in the South-East Asia and Western Pacific Regions, were considered.

It is with this last conference—the Second Asian Malaria Conference—that the present article is concerned. What follows is drawn from a report on the Conference which was approved by the 42 participants, who came from 13 different countries or territories or who represented certain governmental or inter-governmental agencies.

Vector problems

The malaria vector species in the Western Pacific and South-East Asia Regions pose some problems of special interest. For example, it was generally thought before 1952 that the chief vector in the Philippines, *A. minimus flavirostris*, did not often rest indoors during the day and even showed some tendency to avoid DDT-treated surfaces, which would make residual spraying an ineffective means of control; however, a WHO-assisted pilot project in Mindoro has shown that DDT residual spraying of houses will interrupt transmission of malaria by this mosquito. Similarly, the *A. leucosphyrus leucosphyrus* group in Sarawak was considered to be not amenable to control by residual insecticides, but the results of a recent pilot study have suggested that this measure might be effective, although the data are not yet sufficient to draw definite conclusions.

[1] *Chron. Wld Hlth Org.*, 1955, 9, 200, 202
[2] *Chron. Wld Hlth Org.*, 1954, 8, 117
[3] *Chron. Wld Hlth Org.*, 1954, 8, 129
[4] *Chron. Wld Hlth Org.*, 1955, 9, 27, 113

The chief vectors in New Guinea—*A. punctulatus*, *A. farauti*, and *A. koliensis*—have also been studied with a view to their control; and preliminary results of experiments have given promise of the efficacy of residual insecticides.

DDT residual spraying has proved very effective against *A. minimus minimus* in a number of countries: Burma, China (Taiwan), and Thailand. However, it has been observed in the Pays Montagnards du Sud of Viet Nam that DDT residual spraying of houses alone did not bring about a significant reduction in the malariometric indices until after two or three years' successive spraying. "Selective" spraying has given good results against *A. minimus minimus* in Burma, Taiwan, and Thailand.

In Malaya, spraying with DDT and BHC reduced, but did not by any means stop, transmission of malaria carried by *A. maculatus*. It is considered that suppressive drugs are a more effective control method where a rapid effect is required.

A. sundaicus has been effectively controlled by DDT residual spraying in some parts of India and in Indonesia, where it is the principal vector. But in certain areas in Indonesia, development of resistance to DDT has been noted. Thus far, this is the only case of anopheline resistance reported in the South-East Asia and Western Pacific Regions. In two of the areas in question, DDT was used as a larvicide between the years 1947 and 1950, which might account for the development of physiological resistance to this insecticide; in another area, however, probable behaviouristic changes have been observed.

Research

The Conference participants reviewed the malaria research which has been conducted in the South-East Asia and Western Pacific Regions and called attention to points on which study is needed.

With regard to entomological investigations, the need for investigating the problems of colonization of vector species to facilitate basic biological studies was pointed out.

It was suggested that, with their thousands of islands and highly endemic malaria, the South-East Asia and Western Pacific Regions offer particularly rich opportunities for the emergence of malaria parasites with inheritable peculiarities of behaviour, and that observations by research institutions or field workers might help to fill significant gaps in present knowledge of this subject. Among the inheritable variations in the parasites is, for example, that which leads to resistance to proguanil and pyrimethamine. Resistance to both these drugs is known in a few small foci, but the extent of resistance and the distribution of resisting strains throughout the two regions are little known. Even less known are the variations which involve the form of the parasites. Geographical varieties with a distinctive morphology have been described from several parts of the world, but the range and distribution of variation in the parasites of the regions are still to be defined and offer an interesting field for inquiry.

In therapeutics, too, there is need for much research. In the South-East Asia and Western Pacific Regions, as elsewhere, the radical cure of vivax malaria by some simple, safe, and speedy means remains an unsolved problem—and one which will become even more insistent when spraying programmes have arrested mosquito transmission and residual infections come into greater prominence. The most useful drug seems to be primaquine, which, at a dosage of 15 mg base daily for 14 days, terminates the infections caused by certain vivax strains. However, the sensitivity to primaquine of *P. vivax* in the two regions is not well defined, except with regard to one strain from New Guinea and other strains from Korea; the dosage and period of treatment necessary for radical

cure remain uncertain; and further treatment studies are desirable.

Pyrimethamine has been shown to offer encouraging possibilities of suppressive cure at an early stage of vivax infection. Given at a dosage of 25 mg once a week from the start of infection and continued for at least two months, the drug apparently terminates a proportion of vivax infections due to particular strains. Pyrimethamine for this purpose should be the subject of investigations in the South-East Asia and Western Pacific Regions.

Throughout the two regions, the treatment of falciparum infections with single doses of chloroquine or amodiaquine is an accepted and valuable therapeutic measure. However, more information on the sensitivity to these drugs of the prevailing falciparum strains is necessary before it can be assumed that the final cure rate is high.

Continued research is required on control by spraying with insecticides; quality of insecticides, formulations, dosages, and methods of application need to be studied so as to lower the costs of control. Particular subjects for investigation are methods of determining the amounts of chlorinated hydrocarbons remaining on surfaces of varying composition; methods of measuring the degree of sorption and the losses of insecticides in the course of residual spraying, and ways of reducing these losses; and methods of ensuring the application of the desired amount of insecticide per square metre on surfaces of materials from which the liquid tends to run off before a full dose is reached.

There is need also for limited studies of certain naturalistic methods of malaria control, such as the clearing of vegetation in some areas where *A. leucosphyrus* is the vector, and the selective use of automatic siphons in certain *A. minimus flavirostris* streams.

Attention was called to the desirability of investigating the "New Guinea type of endemicity". In some parts of New Guinea, parasite- and spleen-rates in infants and children indicate a very high level of malaria transmission throughout the year, the spleen-rate in children being constantly over 80%. Although the parasite-rate tends to decline at an early age, the spleen-rate of adults remains above 70%. It was suggested that this endemicity be studied by : (1) assessing the transmission rate on the basis of the infective density of the vector and the curve of parasite density in infants and children, and (2) obtaining further data on the development of immunity to the local strains.

Role of drugs

Considerable discussion was devoted at the Conference to the role of drugs in relation to spraying programmes and in special situations.

The theoretical possibilities in the use of drugs are good, but practical difficulties impose limitations. Mass suppressive treatment is impractical, and radical cure is difficult except in falciparum infections.

It was agreed that there are three possible and practical courses of action if there is evidence of clinically active malaria at the beginning of a spraying programme :

(1) The use of drugs during spraying operations only for persons with fever at the time, a single dose of chloroquine or amodiaquine being appropriate. Most falciparum infections would be terminated and all infections so treated would be clinically relieved.

(2) The administration of single doses of chloroquine or amodiaquine to all persons at the time of spraying, a course for which the occurrence of many cases of fever would be a clear indication.

(3) The administration of single-dose treatments, repeated at short intervals for a few weeks. Useful drugs for this purpose are chloroquine, amodiaquine, and pyrimethamine.

Towards the end of spraying programmes, when transmission has been interrupted for a significant period, residual vivax and malariae infections are likely to present a problem for which there is no simple answer; and in many areas with poor dispensary facilities there may be no alternative but to allow the infections to burn themselves out. The most useful drug is primaquine given daily for 14 days at a dosage of 15 mg base. After the interruption of the spraying programme, cases of malaria should be dealt with promptly. It was suggested that a single dose of 600 mg of chloroquine base with 15 mg of primaquine base, given together, would eliminate the immediate dangers to the community.

It was emphasized that epidemics occurring in areas as yet unsprayed demand quick action, and that drugs can best meet the immediate situation. One of the most effective patterns of drug administration is perhaps that of an immediate single dose of 600 mg chloroquine or amodiaquine base with a weekly follow-up of chloroquine, amodiaquine, mepacrine, or pyrimethamine at appropriate dosages and continued as appears necessary. Spraying with insecticides should, of course, also be undertaken at once.

A special situation arises when land is opened up for settlement, and drug suppression may be the answer to the problem during the period of main risk if it has not been possible to provide houses which have been sprayed beforehand with residual insecticides. Another special situation is that which occurs when populations are settled for only part of the year. Here, too, drugs (administered in single doses upon the return home of these populations) may have to supplement spraying.

Attention was drawn to the position of countries which hold large stocks of quinine or mepacrine and are therefore reluctant to buy the newer drugs. The use of quinine imposes an extra burden of administrative difficulties on a national malaria-control organization; but, efficiently used in times of need, the drug can usefully supplement residual spraying programmes. Though less effective than chloroquine or amodiaquine, mepacrine may replace these drugs at the same dosage when the newer drugs are not readily available.

National malaria-control programmes

Documentation on national malaria-control programmes was provided, in answer to a WHO questionnaire, by many countries and territories, representing an aggregate population of 659 million, of which 276 million live in malarious areas. In 1953, 80 million—i.e., 29%—were protected.

Table I summarizes the pertinent data of the programmes on which reports were received.

As at the First Asian Malaria Conference, participants discussed the cost of malaria compared with the cost of controlling the disease and, as before, concluded that control was a sound national investment. Further information on the actual social and economic benefits of malaria control and on the cost of spraying operations is needed, and efforts should be made on the part of governments to obtain such information. Attention should also be given to ways of cutting costs. Standardization of procedures, supplies, and equipment, and the local manufacture of DDT and of spraying equipment in some countries were suggested as possible economy measures.

The Conference participants considered an outline of probable needs for personnel and training for malaria-control programmes in the South-East Asia and Western Pacific countries. This outline and the discussion concerning personnel requirements for malaria-control schemes pointed out the necessity of increasing the existing facilities and initiating new training centres to serve the two regions.

TABLE I. STATUS OF MALARIA CONTROL IN CERTAIN COUNTRIES AND TERRITORIES IN 1953 *

Countries or territories	Total population	Population in malarious regions	Population directly protected	Population still to be protected	International or bilateral assistance	Cost per person protected (US $) [a]
Afghanistan	12 000 000	1 500 000	949 000	551 000	—	0.12
Brunei	55 000	36 000	40 000	4 000	—	0.33
Burma	17 000 000	7 500 000	1 345 722	6 462 000	UNICEF, WHO	Not more than 0.21
Cambodia	4 000 000	400 000	20 000	380 000	WHO, FOA[b]	0.12
Ceylon	8 269 000	3 000 000	3 000 000	—	—	0.20
China (Taiwan)	8 465 350[c]	5 555 000	1 526 306	4 028 694[d]	WHO, FOA	0.17
Hong Kong	2 500 000	2 500 000	2 300 000[e]	200 000	—	0.04
India	361 822 255[f]	200 000 000	63 000 000	137 000 000	FOA	0.09
Indonesia	70-80 million	30 000 000	2 798 590	27 201 410	WHO, FOA	0.16
Japan	87 000 000	516 642	387 560	129 082	—	0.06
Laos	2 602 390	650 579	279 266	371 313	—	—
Nepal	9 000 000	5 100 000	5 000	5 095 000	WHO, FOA	0.13
New Hebrides	48 914	48 000	6 000	42 000	—	—
Netherlands New Guinea	1-1.5 million	2/3 population	10 000[e]	—	—	—
North Borneo	334 141	290 000	—	290 000	—	0.40
Papua and New Guinea	1 616 500	—	24 000[e] 11 000[g]	—	—	—
Philippines	21 400 200	6 000 000	1 000 412	4 999 588	WHO, FOA	0.215
Portuguese India	638 000	111 000	51 500	59 500	—	0.21
Sarawak	546 385	546 385	6 350	540 035	—	0.33
Singapore	1 120 777	1 100 000	1 100 000[e]	—	—	0.113
Solomon Islands	100 150	95 800	1 000	94 800	—	—
Thailand	20 000 000[c]	6 000 000	3 016 808	2 983 192	FOA	0.25
Viet Nam	20 000 000	4 500 000	3 000 000	1 500 000	FOA	0.007
Total	658 720 062	276 449 406	81 835 248	194 614 158	—	—

*** Based on replies of governments to WHO questionnaire. It should be noted that the information is not comparable from one country to another since there is lack of uniformity in the data received and in the methods of calculating costs.**

[a] The cost in US currency has been calculated on the basis of the following exchange rates (equivalent of US $1.00 in local currency):

Afghanistan—21 Afghanis
Burma—4.762 kyats
Ceylon—4772 rupees
China—NT $15.50
India—4.762 rupees
Indonesia—11.4 rupiahs
Malaya—Malayan $3.03
Netherlands New Guinea—3.8 guilders
Philippines—2 pesos
Portuguese India—4.762 rupees
Sarawak—Malayan $3.03
Thailand—12.65 bahts
Viet Nam—35 piastres

[b] Foreign Operations Administration of the USA
[c] 1954
[d] all sprayed in 1954, completed
[e] chiefly, or exclusively, by antilarval measures or drainage
[f] 1951
[g] drugs

The evidence that it was possible, by residual insecticide spraying operations, to terminate malaria transmission over wide areas was reviewed; and the Conference participants concluded that it was advisable to make eradication of the disease the ultimate goal of nation-wide malaria-control programmes.

In this connexion, it was emphasized that there is a great need for co-ordination of antimalaria operations in the different sectors of a country, as well as between countries. This co-ordination should take account of space, time, and efficiency. The persistence among controlled areas of uncontrolled areas, or of sectors lagging behind with regard to effectiveness of results, must be avoided, since this would delay the moment at which it would be safe to discontinue spraying even in the areas considered " controlled ". It was pointed out that any such delays not only prolong the duration and expenses of malaria-control programmes, but also increase the danger of the development of insect resistance to the insecticide being used. Obviously, to ensure co-ordination adequate national malaria services are necessary; malaria advisory committees might also be required in some circumstances; and exchange of technical information, with WHO assistance, would help in the development of programmes.

The problem of possible development of insect resistance to insecticides has made co-ordination of programmes between countries essential. If a country has eradicated malaria it might still run the risk of " re-infection " from surrounding countries which are still highly malarious. Inter-country agreements are called for, so that eradication may be obtained in as large a zone as possible and the danger of re-introducing malaria vectors from outside may be minimized.

Appropriate legislative measures will often be a necessary support to nation-wide programmes aiming at malaria eradication. Countries having antimalaria enactments based on older forms of control may need to revise these in the light of modern objectives and methods.

It was suggested that all national malaria services should adopt standardization of techniques, procedures, and reports as much as possible—for example, by following the indications given in *Malaria terminology*,[5] adhering to the system of uniform reporting of field research proposed by the Malaria Conference in Equatorial Africa,[6] and adopting the patterns of tabulating results and calculating costs of spraying campaigns which have been followed during the last five years by malaria personnel in WHO-assisted projects in different parts of the world.[7]

An attempt was made to define the point at which malaria eradication may be said to be attained—the time at which malaria has ceased to be endemic. It was generally agreed that the absence of any fresh case of indigenous malaria for a minimum period of three years would be an acceptable indication of malaria eradication. To apply this criterion it is essential to have an adequate organization for the discovery and diagnosis of cases of malaria. In some areas it might be useful to have entomological evidence to support that provided by the examination of infants, children, and adults.

There was full agreement on the important point that it is desirable to interrupt residual spraying as soon as feasible, not only to reduce costs of malaria control, but also as a means of preventing, or at least retarding, the development of resistance to insecticides in the vector mosquitos. The moment at which spraying may be safely interrupted is not necessarily the final end-point of malaria endemicity in a given locality, and in each country criteria for interruption of residual spraying should be set up by competent

[5] Covell, G., Russell, P. F. & Swellengrebel, N. H. (1953) *Malaria terminology; report of a drafting committee appointed by the World Health Organization*, Geneva (*World Health Organization: Monograph Series*, No. 13)

[6] *Wld Hlth Org. techn. Rep. Ser.*, 1951, **38**, 63

[7] *Chron. Wld Hlth Org.*, 1955, **9**, 51

authorities who understand thoroughly the local epidemiology of malaria. Adequate surveillance measures should be initiated before spraying is stopped, and provision should be made for immediate emergency resumption of spraying operations wherever and whenever the need arises. Another point that was stressed was that places chosen for interruption of residual spraying should be surrounded either by natural barriers or by areas from which malaria is absent or has already been eradicated.

The eradication of malaria by residual spraying alone may not be possible in some areas, particularly in those parts of the equatorial, wet, seasonless zones where the habits of the vector tend to reduce contact with the insecticide. In such areas residual spraying should perhaps be abandoned in order to avoid the development of insect resistance to the insecticide, and other control methods should be substituted. For example, in certain small *A. minimus* areas that have not responded to DDT residual spraying for several years, it should be possible to eradicate malaria by a combination of pyrethrum house spraying, paris green larviciding, and the appropriate administration of drugs. In other places, sanitary measures to prevent the breeding of the vector might provide the solution.

It was emphasized that when DDT resistance has developed, replacing this insecticide by dieldrin, chlordane, BHC, or lindane might not be effective for long, since experience suggests that when resistance has developed in some insects towards one member of the group of chlorinated hydrocarbons it may quickly extend to the others. It is inadvisable to continue *indefinitely* to attempt malaria control by residual spraying with chlorinated hydrocarbon insecticides.

FREEZE-DRIED BCG VACCINE

The sensitivity of liquid BCG vaccine to light and temperature has, from the first, complicated the organization and carrying-out of mass vaccination campaigns against tuberculosis. In tropical and subtropical regions especially, careful precautions must be taken to prevent deterioration of the vaccine over the long distances from production centre to vaccination centre. This deterioration takes the form of a decrease in the number of viable bacilli, with a consequent reduction in the efficacy of the vaccine.

The common use of the freeze-drying method of conserving vaccines, sera, and various biological preparations suggested that consideration be given to the possibility of applying this technique to BCG, in the hope of obtaining a product which would be more stable and, at the same time, retain its full potency. In Japan, in particular, experiments along this line were already undertaken in 1943. In 1946-47 research started on mass production methods; and, in 1949, when the provisions concerning tuberculosis of the Preventive Vaccination Law came into force, large-scale manufacture commenced in earnest. New problems then emerged, and it became evident that there were considerable differences between the experimental preparation of dried vaccine in a laboratory and mass production. Studies were therefore promoted steadily at the same time as mass production continued.

Papers by Japanese authors, published for the most part in Japanese journals, have so far been accessible to workers in other coun-

tries only in the form of very brief summaries. In publishing a study on this subject by Dr Y. Obayashi [1] in the *Monograph Series*, WHO aims to put at the disposal of those interested in freeze-dried BCG vaccine the data at present available and the conclusions to be drawn from them.

According to Dr Obayashi, the difference between liquid vaccine and dried vaccine is more quantitative than qualitative. During the process of drying at a low temperature a certain number of bacilli are destroyed. These losses may be reduced to a minimum if cultures (on Sauton medium) in the later logarithmic phase of growth are employed. If these losses are compensated for—e.g., by increasing the dose of vaccine injected from 0.04 mg to 0.1 mg—then one obtains, with an equal number of viable bacilli, a preparation producing the same degree of allergy as the liquid vaccine. It seems, as some workers have suggested, that a minimum number of bacilli are necessary if the vaccine is to be effective, and that any increase above this minimum number of bacilli does not appreciably affect the allergenic potency. According to Japanese studies, at least 400 000 units per vaccinal dose (10 million per mg of vaccine) are necessary to ensure a tuberculin-positive conversion-rate of 90%. Most of the dried vaccine prepared in Japan has now reached this level.

Stability is one of the main characteristics of dried vaccine. During the first few months after preparation, the vaccine loses some of its viability, but then it becomes stabilized. The vaccine still retains its high antigenic potency after preservation in a refrigerator for a year; after two years, its potency is slightly lower. It is thus possible to use with confidence long after preparation a dried vaccine which has already reached the stage of stable viability—and whose viability has been demonstrated beforehand, by the cultivation method. From this point of view, dried vaccine has a distinct advantage over liquid vaccine. Such a control is all the more valuable because the viability of a vaccine frequently varies from batch to batch. In Japan, dried BCG vaccine may be used up to 15 months after its preparation, i.e., a year after it has been submitted to control tests.

A fall in allergenic potency occurs when the vaccine is kept at high temperatures (22°C, 30°C, 37°C) or at room temperature in the summer. To retain its effectiveness dried vaccine should not be kept at a temperature above 5°C.

The dried vaccine is sensitive to light, but to a lesser degree than liquid vaccine. Exposure of the dried vaccine to light should be avoided, and it is planned to use coloured glass ampoules to give protection against light.

The vaccine should be kept in ampoules sealed under vacuum, and the moisture content should not exceed 4%. Thus far it does not appear that greater stability is obtained on decreasing the moisture content below 1%.

Despite the advantages which, in Japan, have led to its being preferred to liquid vaccine, the dried BCG prepared at present cannot be considered as fulfilling all the conditions required for practical application on a large scale. In particular, it has not yet been possible to produce a vaccine with satisfactory keeping qualities at relatively high room temperatures. This problem, which is of considerable practical importance, will be the chief object of future investigations by Dr Obayashi.

[1] Obayashi, Y. (1955) *Dried BCG vaccine*, Geneva (*World Health Organization: Monograph Series*, No. 28). 220 pages. Price: £1 15*s*. $5.00, or Sw. fr. 15.— (clothbound).

INCIDENCE OF POLIOMYELITIS IN THE AMERICAS: 1945–1954

In an analysis of the available statistics on the incidence of poliomyelitis in the Americas over the ten-year period 1945-54,[1] the Pan American Sanitary Bureau, which acts as WHO Regional Office for the Americas, provides useful data on a subject of great current interest. This analysis, based on reports of notifiable diseases sent to the Bureau by the governments of the Region, supplements recent WHO studies of the same nature.[2] Although the data on which the analysis is made are not strictly comparable because of the considerable variations in the completeness of reporting poliomyelitis in different countries, they do show trends in incidence and reveal the occurrence of epidemics.

Case-rates during the period 1945-54 were relatively higher in Canada and the USA than in other countries of the Americas (see fig. 1). However, the highest rate recorded was that of an outbreak in 1954 in Costa Rica, when 1081 cases were reported and the case-rate was 118.1 per 100 000 population (fig. 2). Two islands of the Caribbean, Jamaica and Trinidad, also had epidemics in 1954, with the case-rate for the former being 42.7, and that for the latter, 27.1 (fig. 3).

The case-rates for eleven other countries of the Americas are illustrated in figures 4-9. In six of the remaining countries of the Region — Bolivia, Ecuador, Peru, Colombia, Dominican Republic, and Haiti — the number of cases was small and the case-rates were generally below 2.0 per 100 000 population. Only

FIG. 1. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN CANADA AND THE USA, 1945-54

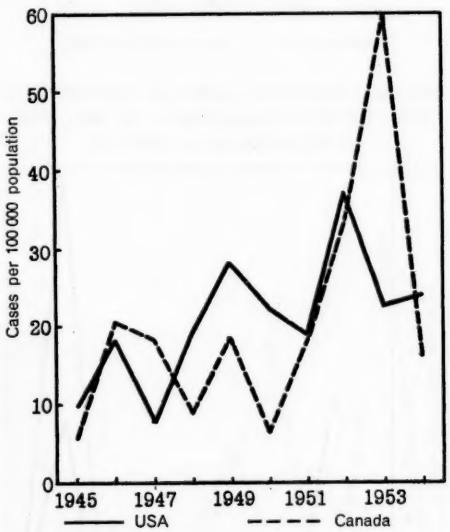
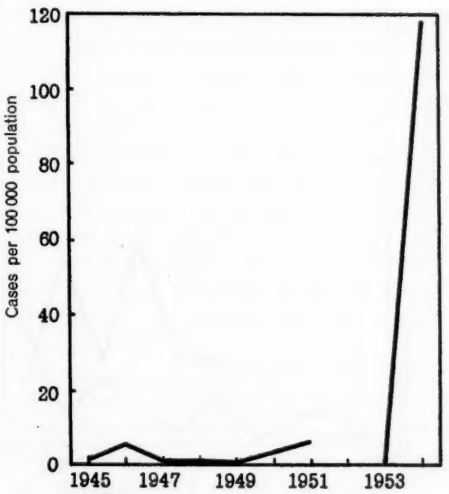


FIG. 2. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN COSTA RICA, 1945-54



[1] *Health statistics*, 1955, 4, 3-11. The present article is drawn from this PASB publication.

[2] Freyche, M.-J. & Nielsen, J. (1955) *Incidence of poliomyelitis since 1920*. In: *Poliomyelitis (World Health Organization: Monograph Series*, No. 26), p. 59
Freyche, M.-J., Payne, A. M.-M. & Lederrey, C. (1955) Poliomyelitis in 1953. *Bull. Wld Hlth Org.*, 12, 595 (Summary in *Chron. Wld Hlth Org.*, 1955, 9, 155)

FIG. 3. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN JAMAICA AND TRINIDAD, 1945-54

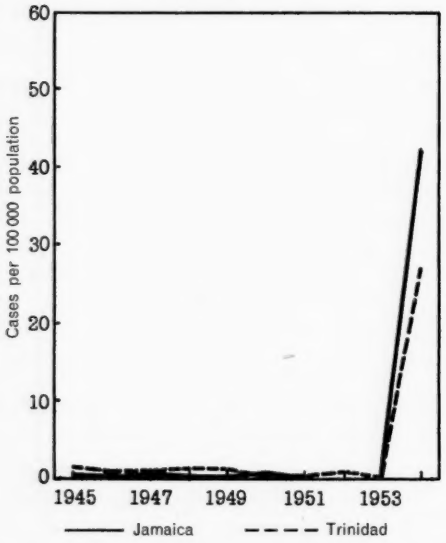


FIG. 4. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN CUBA AND PUERTO RICO, 1945-54

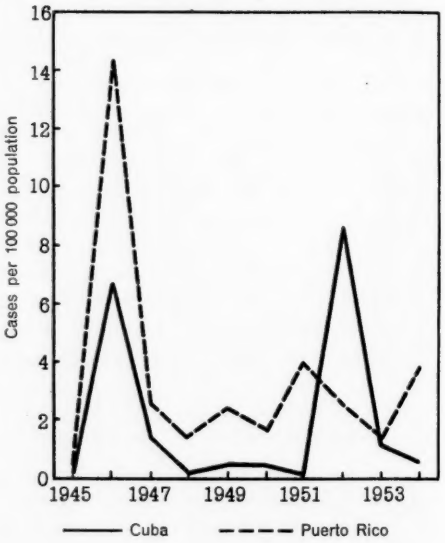


FIG. 5. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN MEXICO AND GUATEMALA, 1945-54

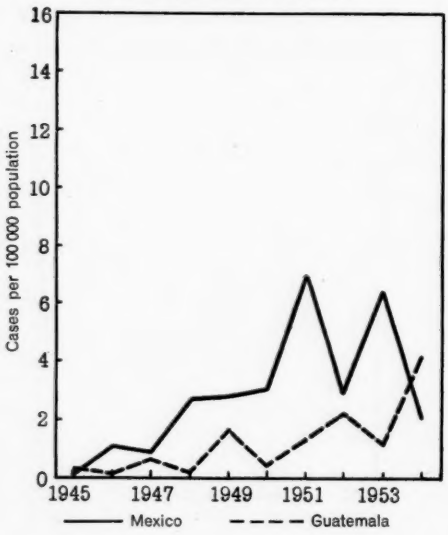


FIG. 6. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN EL SALVADOR AND NICARAGUA, 1945-54

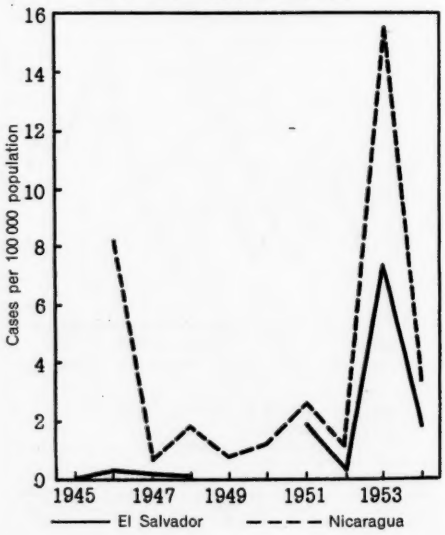


FIG. 7. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN PANAMA AND VENEZUELA, 1945-54

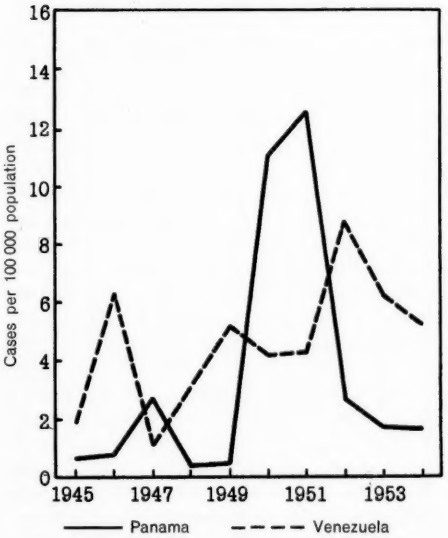


FIG. 8. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN BRAZIL AND URUGUAY, 1945-54

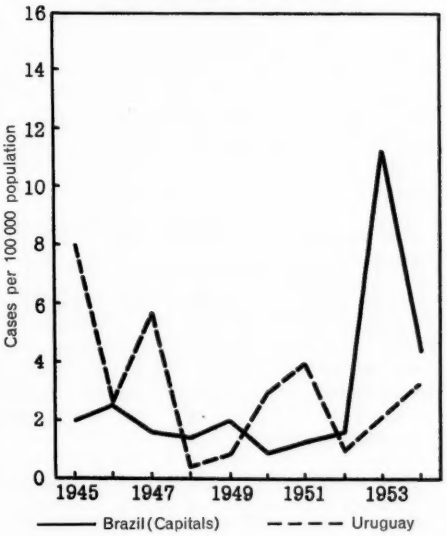
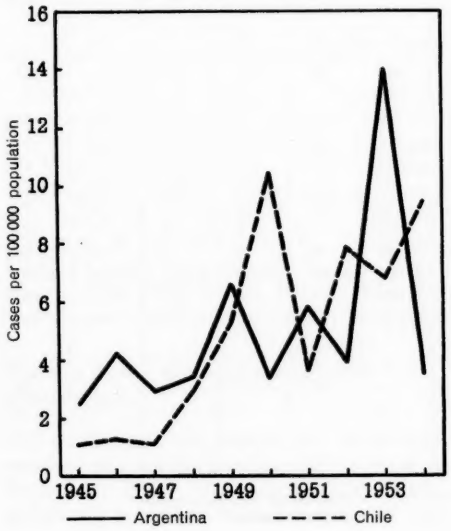


FIG. 9. REPORTED CASES OF POLIOMYELITIS PER 100 000 POPULATION IN ARGENTINA AND CHILE, 1945-54



one case was reported in Haiti during the ten-year period — in 1947. Data for Honduras and Paraguay were not complete enough to be presented graphically.

Data for the territories in addition to those shown for Jamaica, Trinidad, and Puerto Rico (fig. 3 and 4) are also interesting: in several islands no cases were reported for many of the years, but in Grenada, for example, two cases occurred in 1953 and 19 cases in 1954 (a case-rate of 22.5 per 100 000 population); and in Alaska and Hawaii the case-rates increased during the period under study, being relatively high for Alaska for the past five years (1950, 55.9; 1951, 26.8; 1952, 56.7; 1953, 43.2; and 1954, 198.2) and for Hawaii for the past three years (1952, 30.8; 1953, 10.9; and 1954, 43.9).

In summary, the data show an increase in the number of reported cases of poliomyelitis in the Americas during the ten-year period studied, with particularly severe outbreaks during the past few years.

TABLE I. NUMBER OF REPORTED CASES OF POLIOMYELITIS IN CERTAIN COUNTRIES AND TERRITORIES OF THE AMERICAS, 1945-54

Country or territory	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
Alaska	—	1	—	1	1	62	33	80	67	335 [a]
Argentina	387	659	467	552	1 103	586	1 015	695	2 579	652 [a]
Bahamas	—	—	—	—	1	—	...	...	—	—
Barbados	—	2	—	—	4	—	—	—	3	2
Bermuda	...	...	—	1	—	—	—	1	1	1
Bolivia	4	10	...	15	7	4	12	7	2	...
Brazil (Capitals)	124	165	109	101	149	65	104	133	944	379 [a]
British Guiana	—	—	4	—	—	2	5	2	—	3
British Honduras	—	—	1	2	3	—	—	—	3	—
Canada	384	2 527	2 291	1 168	2 438	911	2 568	4 755	8 878	2 432 [a]
Canal Zone	2	1	17	10	4	24	1	15	12	9
Chile	58	71	61	167	300	607	214	461	414	593
Colombia [b]	...	...	88	67	86	133	67	29	153	112
Costa Rica	8	39	7	10	6	30	53	...	9	1 081
Cuba	9	343	74	10	28	28	11	493	68	35 [a]
Dominican Republic	9	2	1	2	—	...	...	—	—	—
Ecuador	11	3	35	15	16	53	25	30 [a]	41	59
El Salvador	—	5	3	2	...	...	37	5	151	38
Guatemala	8	3	18	5	45	13	39	66	37	133
Haiti	—	—	1	—	—	—	—	—	—	—
Hawaii	15	25	37	1	22	23	19	161	57	230
Honduras	...	1	3	...	...	...	90 [a]	...	...	...
Jamaica	4	2	8	5	3	13	2	2	4	647
Leeward Islands										
Antigua	—	1	—	—	—	1	—	—	—	—
Montserrat	—	—	—	—	—	—	—	...	...	...
St. Kitts-Nevis	—	1	—	—	—	—	—	...	4	—
Virgin Islands	—	—	—	—	—	—	—	—	...	...
Mexico	31	247	212	653	683	804	1 834	771	1 787	593
Netherlands Antilles	—	...	—	—	—	7	...	...	...	...
Nicaragua	...	78	7	18	8	13	28 [a]	14 [a]	181	41
Panama	5	6	20	2	4	88	102	22	15	15
Paraguay	...	14	51	15	16	14	...	...	...	51 [a]
Peru	36	49	21	36	35	30	53	127	79	73
Puerto Rico	10	307	57	30	52	38	89	57	31	87
Trinidad and Tobago	9	5	5	8	8	1	2	6	1	189
Uruguay	181	60	128	10	22	73	97	26	56	85
USA	13 624	25 698	10 827	27 726	42 033	33 300	28 386	57 879	35 592	38 740 [a]
Venezuela [b]	27	98	21	69	122	110	121 [a]	262 [a]	193 [a]	169 [a]
Virgin Islands (USA)	—	3	1	—	—	—	—	2	—	...
Windward Islands										
Dominica	1	—	—	—	—	—	—	—	—	—
Grenada	—	—	—	—	—	—	—	—	2	19
St. Lucia	...	—	—	—	1	—	—	—	—	2
St. Vincent	—	—	—	—	—	3	—	—	—	—

... Data not available
— None

[a] Provisional and incomplete
[b] Reporting area

Notes and News

Tuberculosis Control

Changes in the epidemiology of tuberculosis in European countries have been brought about by a reduction in the prevalence of bovine tuberculosis; the ageing of populations; the increasing application of new methods of treatment; general improvements in housing, nutrition, and medical care; and other developments. During the last five years, some countries have recorded a 50-60% reduction in the tuberculosis death-rate. Rates for new cases, however, have fallen concurrently by only 5-10%.

To study the changes in control methods necessitated by these developments, a group of about twenty European public-health administrators, epidemiologists, tuberculosis officers, statisticians, and clinicians will be meeting in Luxembourg in November 1955 at the invitation of the Regional Office for Europe. Countries with low tuberculosis rates rightly realize that special efforts are needed to reduce the incidence of this disease still further.

New Courses at Istanbul Tuberculosis Centre

Post-graduate training for tuberculosis physicians (12th course) and nurses (3rd course) is beginning in Istanbul on 14 September 1955 and will continue until 8 November. The Regional Office for Europe is providing the following lecturers: Dr E. Berthet, Professor E. Bernard, Dr E. Pontefract, Dr D. Thomson, and Mlle Y. Turpin. WHO fellows from the African, Eastern Mediterranean, and European Regions are attending.

Training in the Management of Acute Poliomyelitis

A course, given in French, on the management of acute poliomyelitis will be held in Paris from 10 to 19 October. This course, which will be similar to that held earlier this year in Copenhagen,[1] is being organized by the French Ministry of Health and the Paris Faculty of Medicine, with assistance from WHO and the International Children's Centre.

Anaesthesiology Course

The sixth anaesthesiology training course opened in Copenhagen on 5 August 1955. In the preceding five courses, 64 WHO fellows from abroad and 59 Danes have been trained at the Copenhagen Anaesthesiology Centre, which was established with assistance from WHO.

Training in Insect Vector Control

A training course on the control of insect vectors of disease took place in Rome from 16 May to 30 June 1955. It was organized by the WHO Regional Office for Europe in collaboration with the Istituto Superiore di Sanità and was attended by 16 WHO fellows from the African, Eastern Mediterranean, and European Regions.

The programme included: medical entomology; the transmission by insects of pathogenic bacteria, rickettsia, spirochetes, and helminths; chemistry; toxicology; mode of action and application of insecticides; the control of malaria and leishmaniasis; and fly control as a public health measure.

Malaria-Control Pilot Project in North Borneo

A malaria-control pilot project was begun in North Borneo in July 1955, with the assistance of WHO and UNICEF. WHO appointed Dr W. J. Stoker, former Deputy Chief of Malaria Control of the Ministry of Health of Indonesia, as malariologist, and Professor T. L. Chang, who was previously

[1] See *Chron. Wld Hlth Org.*, 1955, 9, 167.

with the WHO malaria pilot project in the Philippines, as entomologist.

The project aims to study the malaria situation in North Borneo in order to determine the most effective methods of control. Spraying of premises with residual insecticides and other control methods will be tried on an experimental basis, and local personnel will be trained in the various phases of malaria-control work. It is hoped that the pilot project may subsequently be expanded into a full-scale malaria-control programme, with the object of eradicating malaria from the country.

Trachoma in the European Region

Since 1950 several European governments have sought WHO and UNICEF assistance in intensifying existing national anti-trachoma campaigns. Interest has been focused chiefly on the use of antibiotics in mass treatment projects, and satisfactory results have been obtained in the course of school treatment programmes involving already more than 100 000 trachomatous children. Equally important have been advances in knowledge of the epidemiology of trachoma and in the control of factors favouring transmission of infection. Joint WHO/UNICEF programmes are in operation in Morocco, Tunisia, Yugoslavia, and Spain.

The participation of the European Regional Office in anti-trachoma projects consists of consultant visits, the award of fellowships, the engagement of project personnel, inter-country co-ordination of programmes, and the interchange of information and practical experience. Assistance from UNICEF includes provision of antibiotics and other drugs, diagnostic and laboratory equipment, and transport.

Survey on Health and Welfare Workers

In 1950 the European offices of the Rockefeller Foundation and the World Health Organization decided to sponsor jointly a survey of social services in England and France with the principal aim of defining the type or types of health and welfare workers best suited to meet the needs of the family. The rapid development of health education, medical and psychiatric social services, social welfare, and other family services in many countries pointed to the value of such a study. The fact that countries with comparatively highly developed health and welfare services were questioning whether their services were best meeting their needs was an additional justification for the investigation. The survey has now been completed, and a report on the work may be published before the end of 1955.

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11. Effect of residual moisture on preservability of dried BCG vaccine
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